Section 6
Weather Acquisition

The Aviation Weather Network (AWN) was designed to deliver real-time, high-resolution weather products on the ETMS and the ATMS. The AWN system is comprised of four computers. See Figure 6-1.

The AWN system acquires or ingests encoded weather data from the WSI Data Acquisition System (DAS) and generates high resolution aviation weather products. The system monitors, ingest and generation processes informing operators of problems. The WSI DAS system is a 486 PC running the Solaris operating system. This system was designed to receive data from the High Capacity Satellite Network (HCSN) at 1 Mbps and transfer the weather data to a client's ingest system via a local area network.

Execution Control

AWN Product Ingest Subsystem Startup

NOTE: This procedure needs to be performed any time the product ingest machine is rebooted or all of the product ingest processes are not running as background tasks.

(1) Log into the awn account on the product ingest machine.

(2) Start the AWN product ingest processes.
% start_ingest

(3) Check to see that all AWN ingest processes are running as background tasks.
% chk_ingest
The following four tasks should be running.
hrs_ingest
lightning_ingest
nowrad_ingest
text_ingest

AWN Product Generation Monitoring Subsystem Startup

NOTE: This procedure needs to be performed the first time that the product generation monitoring software is installed on the product ingest machine and whenever the cron jobs on the product ingest machine are killed by issuing the stop_cron command

(1) Log into the *awn* account on the product ingest machine.

(2) Start the *AWN* product generation monitoring processes.
% start_cron

(3) Check to see that all *AWN* product generation monitoring processes are set to run as cron jobs.
% chk_cron

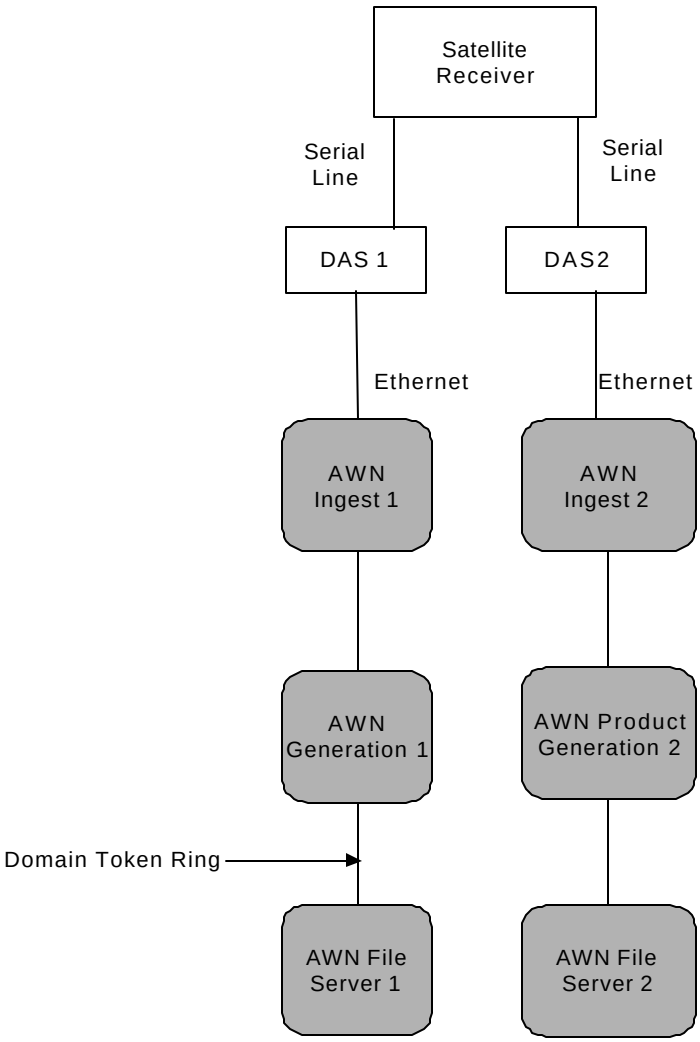

Figure 6-1. AWN System Diagram

AWN Product Ingest Single Task Startup

(1) Log into the *awn* account on the product ingest machine.

(2) Check to see that all *AWN* ingest processes are running as background tasks.
% chk_ingest

The following four tasks should be running:
hrs_ingest
lightning_ingest
nowrad_ingest
text_ingest

(3) If any of the above tasks are not running, start the missing ingest process by:

(a) Move to the appropriate ingest process sub-directory.
% cd /PRODING/(hrs,lightning,nowrad,text)

(b) Start the ingest process by activating the correct C script file.
% (hrs,lightning,nowrad,text)_ingest.csh

(c) Check that the process is running by repeating Step 2.

(d) Repeat step 3a as required to launch additional ingest processes.

AWN Product Generation And Ingest Monitoring Subsystems Startup

NOTE: This procedure needs to be performed the first time the *AWN* product generation subsystem software is installed on the product generation machine and whenever the cron jobs on the product ingest machine have been deleted with the stop_cron command.

(1) Log into the *awn* account on the product generation machine.

(2) Start the *AWN* product generation machine processes.
% start_cron

(3) Check to see that all *AWN* product generation machine processes are set to run as cron jobs.
% chk_cron

AWN Product Ingest Subsystem Shutdown

(1) Log into the *awn* account on the product ingest machine.

(2) Stop all product ingest processes.
% stop_ingest

(3) Verify that all ingest processes have been removed from the system.
% chk_ingest

AWN Product Generation Monitoring Subsystem Shutdown

(1) Log into the *awn* account on the product ingest machine.

(2) Stop all product generation monitoring subsystem processes.
% stop_cron

(3) Verify that all cron jobs have been removed from the system.
% chk_cron

NOTE: There is no listing of cron jobs for this procedure.

AWN Product Generation And Ingest Monitoring Subsystems Shutdown

(1) Log into the *awn* account on the product generation machine.

(2) Stop the *AWN* product generation machine processes.
% stop_cron

(3) Verify that the cron jobs have been removed from the generation machine.
% chk_cron

NOTE: There is no listing of cron jobs for this procedure.

Input

AWN ingests the following raw data:

- NEXET - 88d Echo-tops (1 file)
- NOWRADHF (1 file)
- STORM (STORMCAST+) (1 file)
- LIGHTNING (1 file)
- TAF - Terminal Area Forecasts (1 file)
- METAR (1 file)
- NWS Messages - National Weather Service Messages
- RUC 211 - Rapid Update Cycle (372 files, 40 km grid converted to 80 km grid)

Output

AWN generates the following products:

- Echo_tops

- NOWRAD2km, NOWRAD6
- NOWRA_LAB
- LIGHTNING
- TAF
- METAR
- NWS STATS, NWS CHANGES, NWS ADMIN
- Winds Aloft, Jet Stream

Processing

The *AWN* product ingest subsystem runs under the DOMAIN operating system on an HP 433. The product ingest subsystem is comprised of four processes that establish RPC connections on four separate socket connections to the WSI DAS system (See Figure 6-2).

Encrypted weather data on the HRS, LIGHTNING, NOWRAD, and TEXT sockets are depacketised and the data type is compared to a wanted list. If the data type compares to the wanted data set list then the data is stored to file in its encoded data form. After an encoded data file is made available the product ingest process post a mailbox message, signaling that the data type is ready for further processing (See Figure 6-3).

The ingest process then signals the product ingest monitor of the newly created encoded data file. The *AWN* product generation subsystem runs under the DOMAIN operating system on an HP 433. There are six processes that are invoked by cron on the product generation machine(degriber.csh, echo_tops.csh, lightning.csh, nowrad6.csh, nowrad_lab.csh, and text.csh). When a generation process is started by cron it checks for a mailbox message on the *AWN* product ingest machine. See Table 6-1.

If a message has been posted the generation process moves the corresponding data file from the ingest machine to the generation machine deleting the mailbox message. The generation process decodes and creates the desired aviation weather product placing the weather product data file on the *AWN* file server (See Figure 6-4). The generation process then signals the product generation monitor of the new product.

The *AWN* product monitoring system runs on both the ingest and generation machines. The ingest monitoring system runs on the product generation machine and the generation monitoring system runs on the product ingest machine. Both monitoring systems are invoked by cron at five-minute intervals, on there respective machines. They check latest product availability and send messages to operators if any of the ingest or generation processes are running behind.

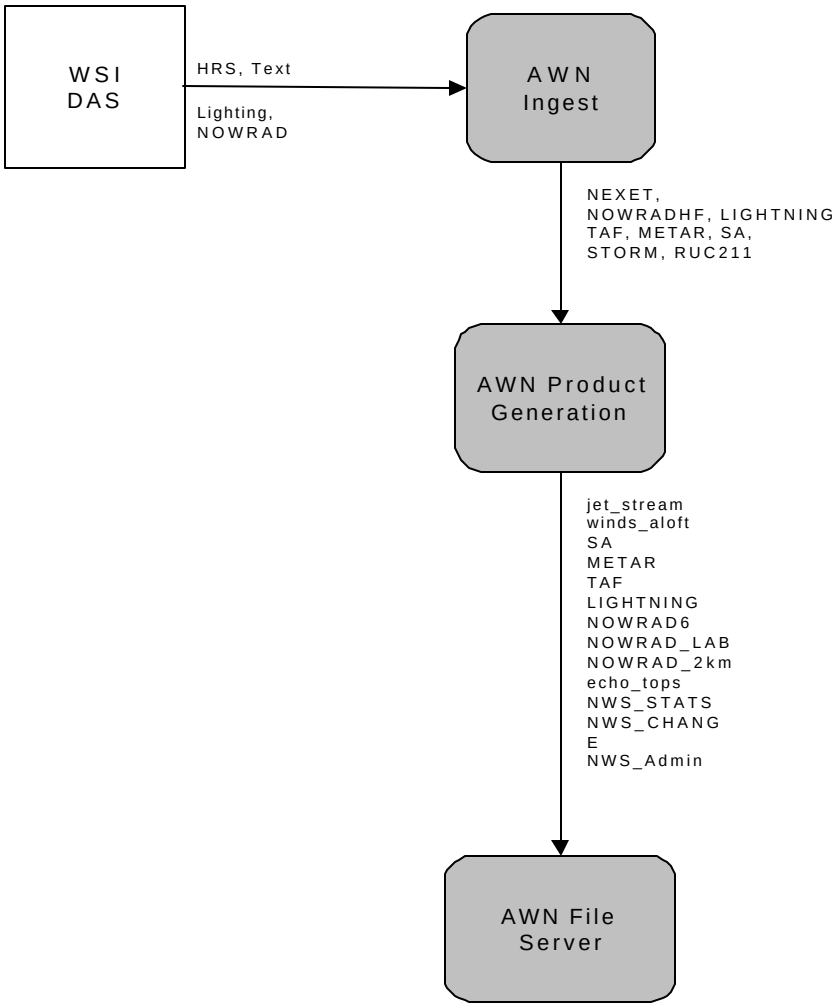

Figure 6-2. AWN System Data Streams

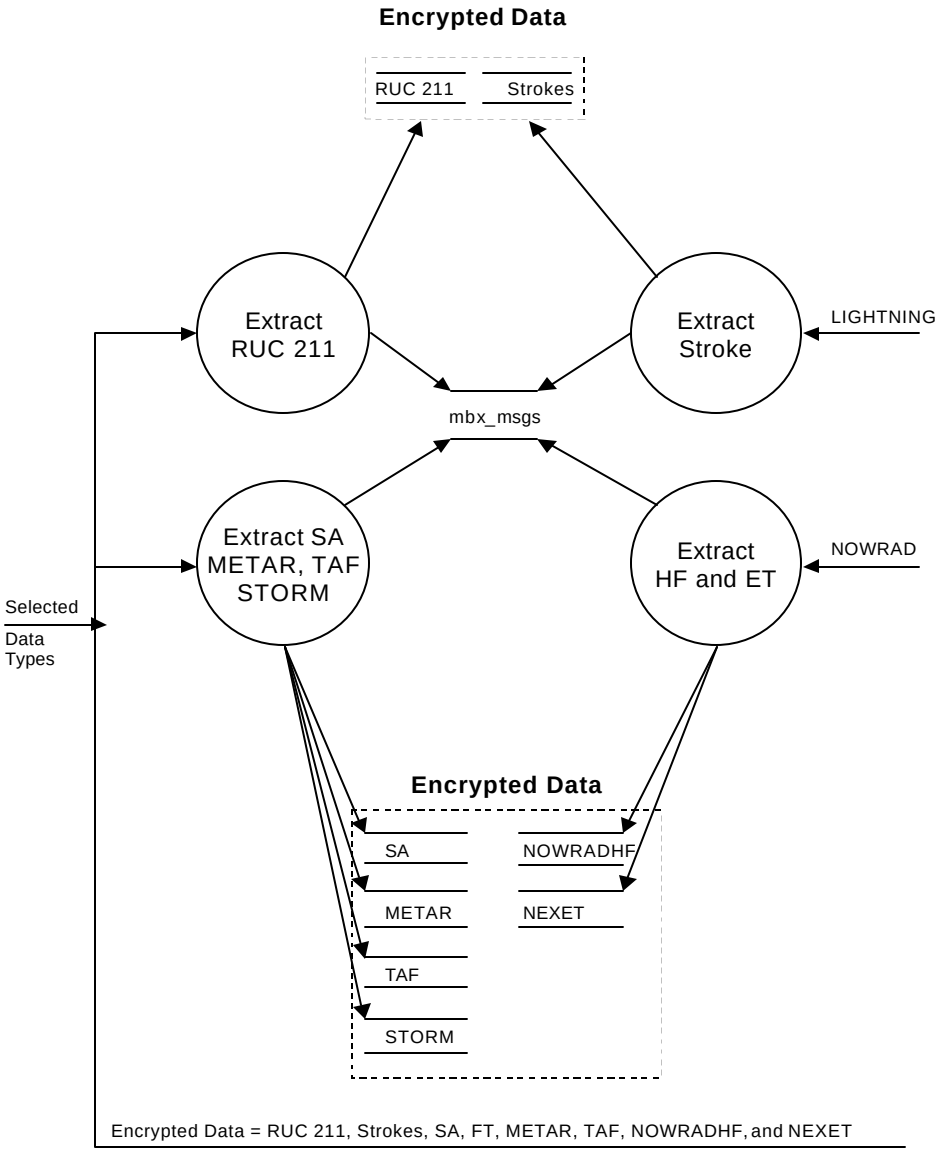

Figure 6-3. Ingest Encrypted Weather Data

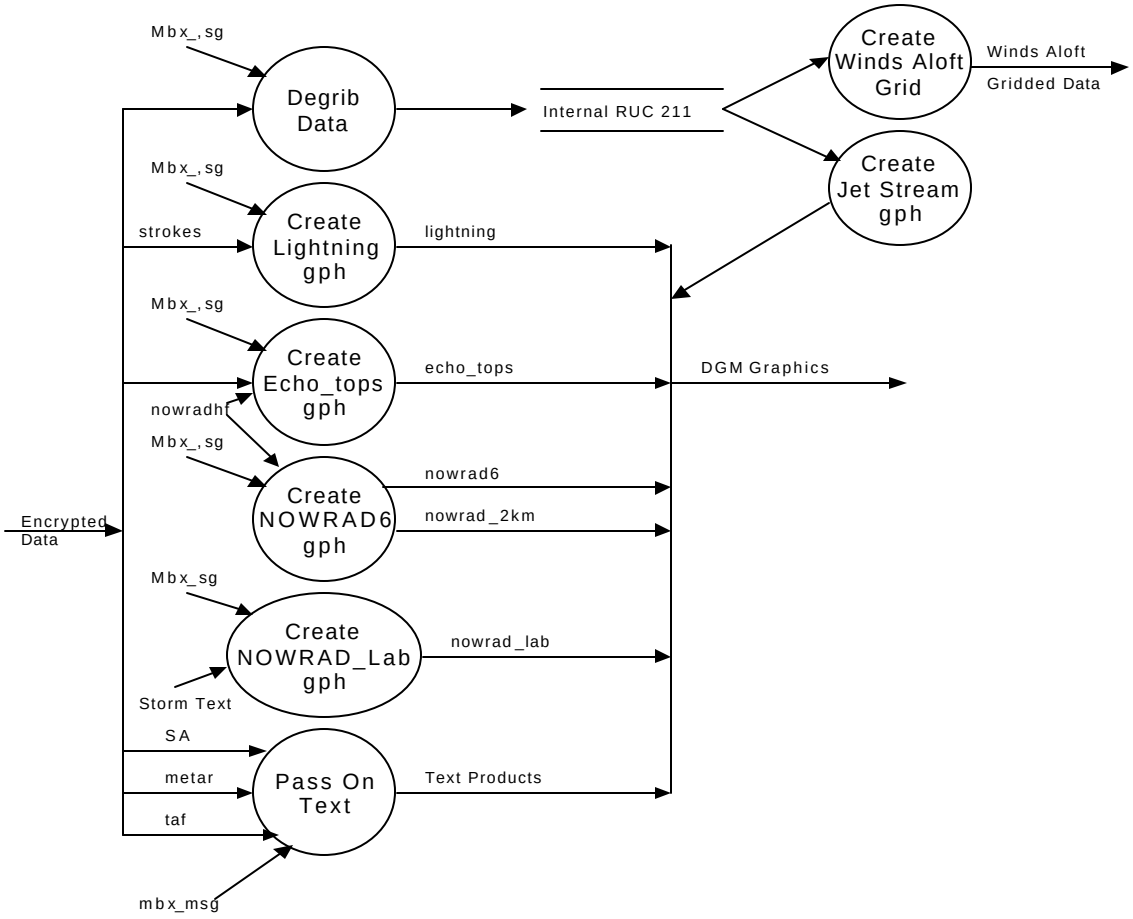

Figure 6-4. Generate Weather Products

Table 6-1. AWN Invoked Processes

Generation Process	Ingest Mailbox	Ingest Process
degriber.csh	/PRODINGdegriber.csh/hrs/ing_mbx	hrs_ingest.csh
echo_tops.csh	/PRODING/nowrad/ing_mbx_et	nowrad_ingest.csh
lightning.csh	/PRODING/lightning/ing_mbx	lightning_ingest.csh
nowrad6.csh	/PRODING/nowrad/ing_mbx_hf	nowrad_ingest.csh
nowrad_lab.csh	/PRODING/text/ing_mbx_storm	text_ingest.csh
text.csh	/PRODING/text/ing_mbx	text_ingest.csh

Error Conditions and Handling

rwsidata : error in data - This is a normal startup error, which means that the ingest process received a message in the middle of a send instead of at the start of message. No user action is required unless there are several of these messages occurring and no lightning data is being received. If this is the case, check the WSI DAS user documentation for troubleshooting procedures.

rwsidata : out of sync with wsidata - The ingest process is not keeping up with the WSI DAS data sends on the ingest product circuit. Check to make sure that the network is functioning properly by pinging the WSI DAS machine from the AWN Product Ingest Machine. Check that the WSI DAS system is functioning properly by looking at the error counts on the system.

***Ingest_process*: cannot connect to wsihcsn** - The ingest process is unable to connect to the WSI DAS system. The WSI DAS is down or there are problems with the WSI DAS system. Consult the WSI Users Manual for the appropriate troubleshooting procedures.

ERROR: Improper number of input args - The product generation executable has been invoked with the wrong number of command line arguments. *generation_process.csh* the C shell script that invokes the executable may have become corrupted. Reinstall the *echo_tops.csh* file from the echo_tops source directory.

%make -f *generation_process* .makefile install

gen_stamp:can't open MONITOR file- mon_log/echo_tops.log - The product generation monitor was not updated with the latest generated data product. Check to see if the mon_log directory in the //"Generation_machine"/PRODGEN/*`product'* directory exists as a link to //"Ingest_machine"/PRODMON/gen_log. Verify that the product ingest machine has not crashed. Make sure that there is sufficient disk space on the ingest machine.

No data notification: "time_now" - The generation process script never received a mailbox message from the ingest process, which receives the raw data processed by the generation process. This means that raw data was never received from the WSI DAS. Contact WSI and find out why the data set was never sent.

6.1 xx6.1 AWN Routines and Files

/FSL

Directory containing all source, script, and make files for the *AWN* system.

README

Information about the directory and files in it.

awn_util

Directory containing source, script, and make files for *AWN* system monitoring, startup, and shutdown procedures.

config

Directory containing all *AWN* configuration files and utilities.

real_time

Directory containing all source and script files for *AWN* product generation, ingest, and monitoring processes.

FSL/awn_util

Directory containing source, script, and make files for *AWN* system monitoring, startup, and shutdown procedures.

README.EXE

README file for the *AWN* operators ~/bin directory.

awn_look

Command for checking current status of all ingest and generation products.

awn_look.c

Source for creating awn_look command.

README

Information about the directory and files in it.

chk_cron

Script for displaying cron jobs running on the *AWN* ingest or generation machines.

chk_ingest

Script for checking product ingest processes.

chk_to_tsc

Script for checking for products on the *AWN* file server.

awn_util.makefile

Make file for creating the awn_look, get_grib_fn, and purge executables.

get_grib_fn

Executable that creates grib data file names command is invoked by the hrs_wind.csh script.

get_grib_fn.c
Source file for creating get_grib_fn.

hrs_jet.csh
Script for creating the jet_stream product using RUC_211 data for the current period.

hrs_wind.csh
Script for creating the winds aloft data product using RUC_211 data for the current period.

purge
Command for deleting files over a day old.

purge.c
Source for creating purge command.

purge_to_tsc
Script used to remove a build up of data files on the *AWN* file server.

start_cron
Script that starts the cron jobs on the *AWN* ingest or generation machine.

start_ingest
Script that starts all *AWN* product ingest routines on the *AWN* ingest machine.

stop_cron
Script that stops all *AWN* cron jobs on the *AWN* ingest or generation machine.

stop_ingest
Script that stops all *AWN* ingest processes on the *AWN* ingest machine.

FSL/config

Directory containing all *AWN* configuration files and utilities.

README
Information about the directory and files in it.

README.EXE
README file for the /FSL/config directories on the generation, ingest, and file server nodes.

awn.config
AWN configuration file.

awn_install.csh
Script for installing *AWN* system software from tape.

config.makefile
Make file used to copy configuration files and utilities to their destination directories.

get_awn_user
AWN configuration utility that returns the configured *AWN* operator account name.

get_das_node
AWN configuration utility that returns the WSI DAS machine name.

get_das_userp
AWN configuration utility that returns the password for the WSI DAS user account.

get_fileserver_node
AWN configuration utility that returns the file servers node name.

get_fsl_node
AWN configuration utility that returns the node name of the FSL data stream file server.

get_generation_node
AWN configuration utility that returns the node name of the product generation machine.

get_ingest_node
AWN configuration utility that returns the node name of the Product Ingest machine.

get_monitor_nodes
AWN configuration utility that returns the node names to send product monitor messages too.

get_monitor_users
AWN configuration utility that returns the names of users to send product monitor messages too.

get_sourcecode_node
AWN configuration utility that returns the node name of the machine that houses the *AWN* system software.

reconfig.csh
Script for rebuilding the *AWN* configuration file and moving files from the /FSL/realtime directories to there operational directories.

FSL/real_time
Directory containing source, script, and make files for *AWN* product generation, ingest, and monitoring processes.

README
Information about the directory and files in it.

generation
Directory containing source, script, and make files for *AWN* product generation.

ingest
Directory containing source, script, and make files for *AWN* product ingest.

prodmongen
Directory containing source, script, and make files for *AWN* product ingest monitoring routines.

prodmoning
Directory containing source, script, and make files for *AWN* product generation monitoring routines.

FSL/real_time/generation
Directory containing source, script, and make files for *AWN* product generation.

README
Information about the directory and files in it.

README.EXE
README file for the /PRODGEN directories on the product generation node.

cp_files
Directory containing makefiles for routines that are used to copy FSL stream data to the *AWN* file server.

degriber
Directory containing source, script, and make files for degribing RUC_211 grib data.

echo_tops
Directory containing source, script, and make files for taking encoded NEXET and NOWRADHF data to generate the echo_tops DGM graphic.

gen.cron
File of product generation cron jobs to be launched at system startup under the *AWN* operators account.

gen.makefile
File used to move the gen.cron file to the *AWN* Product Generation Machine node.

jet_stream
Directory containing source, script, and make files for taking degribed RUC_211 data to generate a DGM jet_stream graphic product.

lib
Directory containing DGM, file naming, and monitoring source file library routines.

lightning
Directory containing source, script, and make files for taking encrypted lightning stroke data to produce DGM lightning graphic output files.

nowrad6
Directory containing source, script, and make files for taking NOWRADHF binary encoded data to produce DGM nowrad6 contour graphic files.

nowrad_lab
Directory containing source, script, and make files for taking storm message ASCII data and NOWRADHF binary encoded data to produce DGM nowrad_lab contour graphic files.

text
Directory containing source, script, and make files for moving METAR, SA, TAF, and NWS ASCII data files from the *AWN* ingest machine to the *AWN* file server.

winds_aloft
Directory containing source, script, and make files for taking degribed RUC_211 data to produce a binary gridded winds_aloft data product.

FSL/real_time/generation/cp_files
This directory contains the executables and make files required for creating product generation file names and product generation notification messages. These executables should be placed in all PRODGEN subdirectories that copy files from the FSL data stream. (degriber,jet_stream).

README
Information about the directory and files in it.

cp_files.makefile
Make file that executes the get_name and set_gen_stamp make files.

get_name
Executable for creating the product file name for the current period.

get_name.makefile
Make file for creating the get_name executable.

set_gen_stamp.makefile
Make file for creating the set_gen_stamp executable.

set_gen_stamp
Executable used for product generation notification.

FSL/real_time/generation/degriber
This directory contains the source and make files necessary for creating the degriber executable.

BmsDefs.h
Definitions of Bit Map Sections in Grib.

FSLGrids.h
Definitions used to format LAPS and MAPS grids.

Grib.h
Definitions used to access GRIB encoded data.

GribDefs.h
Definitions used by all GRIB translator software.

GribLib.c
Routines used for GRIB format processing.

GribLib.h
Prototypes and include definitions for routines used for GRIB format processing.

Grid.h
Definitions of the FSL internal (OPAQUE) grid data format.

GridDefs.h
Definitions used by the GRIB translator client.

GridTabl.h
Cross referenced translation tables to convert WMO GRIB to FSL internal Grid format.

LapsProds.h
Definitions used by the GRIB encoder.

MapsProds.h
Definitions used by the GRIB encoder.

README
Information about the directory and files in it.

README.EXE
README file for the /PRODGEN/degriber directory on the *AWN* generation machine.

RunGrib.h
Definitions used to access the header.

TableTypes.h
Cross referenced translation tables Data Structures.

degriber
Degribing executable.

degriber.c
RUC_211 degriber driver.

degriber.csh
Script file that launches the degriber executable.

degriber.makefile
File for building the degriber executable.

grib_decoder.h
Header file for the GRIB decoder.

FSL/real_time/generation/echo_tops

Directory containing source, script, and make files for taking encoded NEXET and NOWRADHF data to generate the echo_tops DGM graphic.

README

Information about the directory and the files in it.

README.EXE

README file for the /PRODGEN/echo_tops directory on the *AWN* generation machine.

aux.c

C source file containing routines for helping decode WSI nexrad data.

change_res_echotops.c

C source file containing a routine that reduces 64 height vals to 16 height vals.

define_echotops.c

C source file containing routines that create the DGM echo_tops graphic file.

echo_tops.csh

Script file launched by crontab that runs the echo_tops executable.

echotops.h

Header file containing echo_top specific definitions.

nexrad.h

Header file containing definitions for NEXRAD encoded binary data.

processHeader.c

C source file containing routines used to decode the WSI encoded binary NEXRAD/NOWRAD data header.

processImage.c

C source file containing routines used to decode the WSI encoded binary NEXRAD/NOWRAD image data.

wsidecoder.c

C source file containing the routine that decodes the WSI encoded binary NEXRAD/NOWRAD data.

FSL/real_time/generation/jet_stream

This directory contains the source and make files necessary for creating the jet_stream executable.

README

Information about the directory and the files in it.

README.EXE

README file for the /PRODGEN/jet_stream directory on the *AWN* generation machine.

Rungrib.h
Header file describing header portion of degribed RUC_211 data.

con.f
Fortran source file containing contouring routines.

dgmrealarea.f
Fortran source file containing a routine that maps coordinates to real values.

dgmtext.f
Fortran source file containing a routine that creates DGM text output instructions.

dgmvectors.f
Fortran source file containing a routine that creates DGM vector output instructions.

dgmwrite.f
Fortran source file containing the routines that write DGM instructions to file.

dsp.f
Fortran source file that contains routines that create stream lines for the jet_stream graphic.

geodefs.h
Geographical mapping definitions header file.

geolib.h
Geographical mapping routines definitions header file.

get_etadata.c
C source file containing routines that read degribed RUC_211 data from file.

getarealim.c
C source file containing routines that return the boundary of the area to be graphed.

grid211.sup
SUP file for containing mapping information for the RUC_211 grid.

gridremapper.c
C source file containing routines that remap gridded data from one projection to another.

initgeofile.c
C source file containing routines that read in SUP files and initialize geographical data for mapping grids.

jet_cpy.csh
C shell script file that copies the 60km FSL jet_stream graphic product to the *AWN* file server.

jet_stream
Executable for creating the jet_stream DGM graphic product.

jet_stream.c
C source file containing the driver routine for creating the jet_stream DGM graphic.

jet_stream.csh
Script file that launches the jet_stream executable.

jet_stream.makefile
Make file for creating the jet_stream executable.

jtsub.f
Fortran source file that contains the routine that creates the heights, contours, and stream lines for the jet_stream DGM graphic file.

ll_to_xy.c
C source file that contains routines that convert lat and lon values to x and y indices.

maps60.sup
SUP file containing mapping information for the RUC hybrid b grids.

windremapper.c
C source file containing routines that map wind speed and direction from one projection to another.

xy_to_ll.c
C source file containing routines that convert x and y indices to lat and lon coordinate values.

FSL/real_time/generation/lib
Directory containing DGM, file naming, and monitoring library routines.

DGM
Directory containing DGM fortran library routines.

DGMC
Directory containing DGM C library routines.

FILE_NAMES
Directory containing file naming library routines.

MONITOR
Directory containing product generation monitor library routines.

README
Information about the directory and files in it.

FSL/real_time/generation/lib/DGM
This directory contains the DARE Graphic Metafile (DGM) fortran library routines. There are no make files in this directory all files are built from the prodgen subdirectories. If any file is changed in this directory make should be run in all prodgen subdirectories.

README
Information about this directory and the files in it.

dgmabsolute.f
Sets absolute addressing.

dgmalign.f
Sets alignment of character data.

dgmbarb.f
Instructions used to draw wind barbs.

dgmblocking.f
Sets character blocking mode.

dgmcenter.f
Sets centering characteristics.

dgmcharmag.f
Sets character sizing.

dgmcolor.f
Sets display color class.

dgmdefaults.f
Sets DGM default attributes for DGM characteristics.

dgmfont.f
Sets font type.

dgmlines.f
Sets line type.

dgmmark.f
Saves current location in DGM buffer.

dgmptor.f
Changes from integer to real coordinates.

dgmrealarea.f
Sets real area addressing limits.

dgmrelative.f
Sets relative addressing.

dgmrtop.f
Changes from real to integer coordinates.

dgmsetdc.f
Sets display class.

dgmsetpoly.f
Sets polygon modes.

dgmsize.f
Sets graphical sizing.

dgmspacing.f
Sets spacing between characters.

dgmtext.f
Instructions for placing text.

dgmtexture.f
Sets line texture.

dgmundo.f
Clears all instructions in the DGM buffer that occur after the last call to dgmmark.

dgmvector.f
Creates vector instructions.

dgmvectors.f
Creates linked vector instructions.

dgmwrite.f
Saves DGM instructions in a buffer and writes the buffer to file.

FSL/real_time/generation/lib/DGMC

This directory contains the DARE Graphic Metafile (DGM) C library routines. There are no make files in this directory all files are built from the prodgen subdirectories. If any file is changed in this directory make should be run in all prodgen subdirectories.

README
Information about this directory and the files in it.

dgmabsolute.c
Sets absolute addressing.

dgmalign.c
Sets alignment of character data.

dgmbarb.c
Instructions used to draw wind barbs.

dgmblocking.c
Sets character blocking mode.

dgmcenter.c
Sets centering characteristics.

dgmcharmag.c
Sets character sizing.

dgmcolor.c
Sets display color class.

dgmdefaults.c
Sets DGM defaults for setable DGM characteristics.

dgmfont.c
Sets font type.

dgmlines.c
Sets line type.

dgmmark.c
Saves current location in DGM buffer.

dgmptor.c
Changes from integer to real coordinates.

dgmrealarea.c
Sets real area addressing limits.

dgmrelative.c
Sets relative addressing.

dgmrtop.c
Changes from real to integer coordinates.

dgmsetdc.c
Sets display class.

dgmsetpoly.c
Sets polygon modes.

dgmsize.c
Sets graphical sizing.

dgmspacing.c
Sets spacing between characters.

dgmtext.c
Instructions for placing text.

dgmtexture.c
Sets line texture.

dgmundo.c
Clears all instructions in the DGM buffer that occur after the last call to dgmmark.

dgmvector.c
Creates vector instructions.

dgmvectors.c
Creates linked vector instructions.

dgmwrite.c
Saves DGM instructions in a buffer and writes the buffer to file.

FSL/real_time/generation/lib/FILE_NAMES

This directory contains routines for creating the file names that are used on the *AWN* system.

README
Information about this directory and files in it.

get_name.c
C source file containing the routine for creating a file name given a product generation file type.

FSL/real_time/generation library/lib/MONITOR
This directory contains the Product Generation Monitor routines. If any file is changed in this directory make should be run in all generation subdirectories.

README
Information about this directory and the files in it.

gen_stamp.c
Routine that writes product generation message to the product generation log.

set_gen_stamp.c
Given a product generation name and file name creates a product generation log file.

FSL/real_time/generation/lightning
This directory contains the source and make files necessary for creating the lightning product generation executable.

README
Information about this directory and the files in it.

README.EXE
README file for the /PRODGEN/lightning directory on the *AWN* generation machine.

dgm_lightning.c
C routines for creating DGM lightning graphic data file.

lightning.c
C routine for driving lightning product generation.

lightning
Lightning product generation executable.

lightning.csh
Script file that is launched by cron at five minute intervals. This script executes the lightning process whenever new data is available.

lightning.makefile
Make file used to create lightning executable.

FSL/real_time/generation/nowrad6
This directory contains the source and make files necessary for creating the NOWRAD6 executable.

README
Information about this directory and the files in it.

README.EXE
README file for the /PRODGEN/nowrad6 directory on the *AWN* generation machine.

aux.c
C source file containing routines for helping decode WSI nexrad data.

change_resolution.c
Reduces a WSI 16 level 2km nowrad product to a 6 level 8km nowrad product.

conpoly.f
Fortran source file containing routines for contouring a nowrad image.

nowrad.c
Driver routine for nowrad products.

nowrad6.csh
Script that launches the nowrad6 executable.This script is invoked by CRON on the PRODUCT GENERATION machine.

nowrad.h
Header file containing definitions for NOWRAD encoded binary data.

nowrad6.makefile
Make file for creating the nowrad6 executable.

nowrad6
NOWRAD6 executable.

processHeader.c
C source file containing routines used to decode the WSI encoded binary nexrad/nowrad data header.

processImage.c
C source file containing routines used to decode the WSI encoded binary nexrad/nowrad image data.

setx.f
Sets outer most grid coordinates for creating the nowrad contours.

wsidecoder.c
C source file containing the routine that decodes the WSI encoded binary nexrad/nowrad data.

/FSL/real_time/generation/nowrad_lab
This directory contains the script files required for copying the nowrad_lab product from the ERL data stream to the FSL data stream.

README
Information about this directory and the files in it.

README.EXE
README file for the /PRODGEN/nowrad_lab directory on the *AWN* generation machine.

nowrad_lab.csh
Script launched by cron that copies the required nowrad_lab product from the FSL data stream to the *AWN* file server.

/FSL/real_time/generation/text
This directory contains the source and make files necessary for creating the METAR, SA, TAF, and NWS text products.

README
Information about this directory and the files in it.

README.EXE
README file for the /PRODGEN/text directory on the *AWN* generation machine.

text.csh
Script launched by cron that moves the METAR, SA, TAF, and NWS ASCII files to the *AWN* file server directories.

text.makefile
Make file for the text_mon process.

text_mon.c
Notifies product generation monitor of text product availability.

FSL/real_time/generation/winds_aloft
This directory contains the source and make files necessary for creating the winds_aloft executable.

README
Information about the directory and the files in it.

README.EXE
README file for the /PRODGEN/winds_aloft directory on the *AWN* generation machine.

Rungrib.h
Header file describing header portion of degribed RUC_211 data.

chkvc.c
Interprets the direction of increasing vertical height in an array of heights.

defsfc.c
Calculates the position within the database grid of a surface which is defined everywhere having the parameter stored in *sfcdata* and **vrt** being equal to **value**. The data on the location of this surface is put into *coefs* in order that it may be later used by *plotonsurface* to analyze any give parameter on that surface. Defines a height for the surface.

geodefs.h
Geographical mapping definitions header file.

geolib.h
Geographical mapping routines definitions.

get_etadata.c
Reads degribed RUC_211 data from file.

getarealim.c
Returns boundary of area to be graphed.

ggdat.c
Returns value of array **A** at point i,j. If the point is flagged routine tries to interpolate.

grid211.sup
SUP file for mapping RUC_211 grids to other projections.

gridremapper.c
Grid remapping routines.

initgeofile.c
Reads in SUP file and initialize geographical data for mapping grids.

linit.c
Performs linear interpolation.

ll_to_xy.c
Converts lats and lons to x and y indices.

maps60.sup
SUP file for RUC hybrid b grids.

plotonsfc.c
Combines surface and upper air data and analyzes it on a 2D surface defined by *coefs*.

windremapper.c
Wind speed remapping routines.

winds_aloft
Executable for creating the winds_aloft product.

winds_aloft.c
Driver routine for creating the winds_aloft binary gridded data file.

winds_aloft.csh
Script file that launches the winds_aloft executable.

winds_aloft.makefile
Make file for creating the winds_aloft executable.

xy_to_ll.c
Converts x and y indices to lat and lon values.

ztopsa.f
Converts height to pressure level in millibars.

FSL/real_time/ingest
This directory contains the source, script, and make files for all product ingest processes.

README
Information about the directory and the files in it.

README.EXE
README file for the /PRODING directory on the *AWN* product ingest machine.

awn_ingest.csh
Script used to launch all *AWN* Product Ingest Tasks.

hrs
This directory contains the source, script, and make files for the hrs_ingest process.

ing.cron
obs that need to be started by cron on the *AWN* Product Ingest Machine node.

ing.makefile
Make file used to move awn_ingest.csh and ing.cron to the *AWN* Product Ingest Node.

lightning
This directory contains the source, script, and make files for the lightning_ingest process.

nowrad
This directory contains the source, script, and make files for the nowrad_ingest executable.

text
This directory contains the source, script, and make files for the text_ingest process.

lib
This directory contains the product ingest monitor library source files.

FSL/real_time/ingest/hrs
This directory contains the source and make files necessary for creating the hrs_ingest executable.

README
Information about the directory and the files in it.

README.EXE
README files for the /PRODING/hrs directory on the *AWN* ingest machine.

hrs_ingest
hrs_ingest executable.

hrs_ingest.c
hrs_ingest driver routines. Extracts RUC_211 U and V wind component grids from WSI hrs feed.

hrs_ingest.csh
Script file for launching the hrs_ingest executable.

hrs_ingest.makefile
File for rebuilding hrs_ingest executable.

write_hrs.c
Routines for writing extracted grids to file, posting the ingest mailbox message, and notifying the product monitor.

FSL/real_time/ingest/lightning
This directory contains the source and make files necessary for creating the lightning_ingest executable.

README
Information about the directory and the files in it.

README.EXE
README file for the /PRODING/lightning directory on the *AWN* ingest machine.

lightning_ingest
Lightning WSI data ingest executable.

lightning_ingest.csh
Script file for launching lightning_ingest executable.

lightning_ingest.makefile
Make file for creating the lightning_ingest executable.

write_lightning.c
Routines for writing encrypted lightning data to file, posting the ingest mailbox message, and notifying the product monitor.

lightning_ingest.c
Driver routines for extracting encrypted lightning products from the WSI DAS lightning circuit.

FSL/real_time/ingest/nowrad
This directory contains the source and make files necessary for creating the nowrad_ingest executable.

README
Information about the directory and the files in it.

README.EXE
README file for the /PRODING/nowrad directory on the *AWN* ingest machine.

nowrad_ingest
Nowrad WSI data ingest executable.

nowrad_ingest.c
Driver routines for extracting the NOWRADHF and NEXET data products from the WSI DAS nowrad circuit.

nowrad_ingest.csh
Script file for launching the nowrad_ingest executable.

nowrad_ingest.makefile
Make file for creating the nowrad_ingest executable.

write_nowrad.c
Routines used to write NOWRADHF and NEXET encoded binary data to data files, posting the ingest mailbox messages, and notifying the product monitor.

FSL/real_time/ingest/text

This directory contains the source and make files necessary for creating the text_ingest executable.

README
Information about the directory and the files in it.

README.EXE
README file for the /PRODING/text directory on the *AWN* ingest machine.

text_ingest
text_ingest executable

text_ingest.c
Driver routines for extracting METAR, SA, TAF, and NWS data from the WSI DAS text circuit.

text_ingest.csh
Script file for launching the text_ingest executable.

text_ingest.makefile
File for rebuilding text_ingest executable.

write_text.c
Routines for writing METAR, SA, TAF, and NWS text messages to data files, posting ingest mailbox messages, and notifying the product monitor.

FSL/real_time/ingest/lib/MONITOR

This directory contains the product ingest monitor source files. These files are used by all product ingest processes.

README
Information about the directory and the files in it.

ing_stamp.c
Product ingest monitor notification routine.

FSL/real_time/prodmongen
This directory contains the scripts and source files required for generating Product Ingest Monitor messages.

README
Information about this directory and the files in it.

README.EXE
README file for the /PRODMON directory on the *AWN* generation machine.

ing_mon.csh
Script launched by crontab on a per ingest product basis (lightning,hrs,nowrad,text) that generates a product status message.

pd_ing_mon
Executable launched by ing_mon.csh to read ing_log messages and create product ingest messages.

pd_ing_mon.c
Source for pd_ing_mon executable.

pd_ing_mon.makefile
Make file for creating the pd_ing_mon executable.

send_ing_msg.csh
Sends product ingest alert messages to the operators.

FSL/real_time/prodmoning
This directory contains the scripts and source files required for generating Product Generation Monitor messages.

README
Information about this directory and the files in it.

README.EXE
README file for the /PRODMON directory on the *AWN* ingest machine.

gen_mon.csh
Script launched by crontab on a per product basis (echo_tops, jet_stream, lightning, nowrad, nowrad6, nowrad_lab, text, winds_aloft) that generates a product status message.

pd_gen_mon
Executable launched by gen_mon.csh to read gen_log messages and create product generation messages.

pd_gen_mon.c
Source for pd_gen_mon executable.

pd_gen_mon.makefile
Make file for building pd_gen_mon executable.

send_gen_msg.csh
Sends product ingest alert messages to operators.

The following are AWN File Server Routines and Files:

/NWS
Directory that contains all National Weather Service (NWS) administrative, change notification, and status messages.

nwsadm
Directory containing all NWS administrative messages.

nwschn
Directory containing all NWS change notifications.

nwssta
Directory containing all NWS status notifications.

/to_atms
Directory that houses all the newly created *AWN* ATMS weather products.

wx_atms
Directory that houses all the newly created *AWN* ATMS weather graphic products.

wx_atms/echo_tops
Directory that houses the newly created *AWN* echo_tops graphic product.

wx_atms/nowrad_2km
Directory that houses the newly created *AWN* nowrad 2km image.

/to_tsc
Directory that houses all the newly created *AWN* ETMS weather products.

metar
Directory that houses all the newly created *AWN* ETMS routine and special surface observations in aviation routine weather report format.

sa
Directory that houses all the newly created *AWN* ETMS surface observation ASCII messages.

taf
Directory that houses all the newly created *AWN* ETMS terminal forecast in the international terminal aerodrome format.

winds
Directory that houses all the newly created *AWN* ETMS gridded wind products.

wx_maps
Directory that houses all the newly created *AWN* ETMS weather graphic products.

winds/aloft
Directory that houses all the newly created *AWN* ETMS winds aloft gridded data products.

wx_atms/jet_stream
Directory that houses all the newly created *AWN* ETMS jet stream graphic products.

wx_atms/lightning
Directory that houses all the newly created *AWN* ETMS lightning graphic products.

wx_atms/nowrad6
Directory that houses all the newly created *AWN* ETMS nowrad6 graphic products.

wx_atms/nowrad_lab
Directory that houses all the newly created *AWN* ETMS nowrad_lab (storm and radar location) graphic products.

The following are AWN Product Ingest Routines and Files:

/PRODING

This directory houses all of the *AWN* product ingest processing routines.

README

Information about directory and files in it.

atms_ingest.csh

Script for launching all product ingest processes. This script should be run whenever the product ingest machine is restarted.

ing.cron

Cron commands for starting product generation monitor and purging routines.

hrs

Contains executables and scripts for ingesting RUC_211 grib data.

lightning

Contains executables and scripts for ingesting lightning stroke data.

nowrad

Contains executables and scripts for ingesting nowradhf, nowradhd, and nexet encoded binary data.

text

Contains executables and scripts for ingesting METAR, SA, TAF, and NWS text messages.

PRODING/hrs

This directory contains the executable and script files required for ingesting RUC_211 grib data.

README

Information about directory and files in it.

hrs_ingest

Executable that extracts RUC_211 grib data from the WSI DAS hrs circuit.

hrs_ingest.csh

Script file for launching hrs_ingest executable. This file can be run from the *AWN* operators account by typing hrs_ingest.csh. This script is normally launched at system startup by invoking the atms_ingest.csh script from the *AWN* operators account.

hrs_ingest.log

ASCII file containing all hrs_ingest messages.

ing_mbx

hrs_ingest mailbox directory. Used to communicate ingest product availability to the hrs generation process.

mon_log
Monitor notification log directory.

ruc_211
RUC_211 GRIB formatted data files.

PRODING/lightning

This directory contains the executable and script files required for ingesting lightning stroke data.

README
Information about directory and files in it.

ing_mbx
Lightning ingest mailbox directory. Used to communicate ingest product availability to the lightning generation processes.

lightning_ingest
Executable that extracts lightning stroke data from the WSI DAS lightning circuit.

lightning_ingest.csh
Script file for launching lightning_ingest executable. This file can be run from the *AWN* operators account by typing lightning_ ingest.csh. This script is normally launched at system startup by invoking the atms_ingest.csh script from the *AWN* operators account.

lightning_ingest.log
File containing ASCII text error messages generated by the lightning_ingest executable.

mon_log
Monitor notification log directory.

product
Lightning ingest product directory. Accumulates encrypted lightning messages into 5 minute data files.

PRODING/nowrad

This directory contains the executable and script files required for ingesting NEXET/NOWRADHF encoded binary data.

README
Information about the directory and the files in it.

ing_mbx_et
NEXET ingest mailbox directory. Used to communicate raw data product availability to the echo_tops generation process.

ing_mbx_hf
NOWRADHF ingest mailbox directory. Used to communicate raw data product availability to the nowrad6 generation process.

nexet
NEXET raw data product directory.

nowradhf
NOWRADHF raw data product directory.

mon_log
Monitor notification log directory.

nowrad_ingest
Executable for extracting NEXET and NOWRADHF encoded binary data from the WSI DAS nowrad circuit.

nowrad_ingest.csh
Script file for launching nowrad_ingest executable. File can be run from the *AWN* operators account by typing nowrad_ingest.csh. This script is normally launched at system startup by invoking the atms_ingest.csh script from the *AWN* operators account.

nowrad_ingest.log
ASCII file containing all nowrad_ingest messages.

PRODING/text

This directory contains the executable and script files required for ingesting METAR, SA, TAF, and NWS, ASCII data.

README
Information about the directory and the files in it.

ing_mbx
Text ingest mailbox directory. Used to communicate raw data product availability to the text generation process.

metar
Routine and special surface observations in aviation routine weather report format.

mon_log
Monitor notification log directory.

nwsadm
Directory containing all NWS administrative messages.

nwschn
Directory containing all NWS change notifications.

nwssta
Directory containing all NWS status notifications.

sa
Surface Aviation observation product directory. Accumulates sa text messages into 10 minute data files.

taf
Terminal forecasts in international terminal aerodrome format.

text_ingest
Executable for extracting METAR, sa, and TAF ASCII text messages from the WSI DAS text circuit.

text_ingest.csh
Script file for launching text_ingest executable. File can be run from the *AWN* operators account by typing text_ingest.csh. This script is normally launched at system startup by invoking the atms_ingest.csh script from the *AWN* operators account.

text_ingest.log
ASCII file containing all text_ingest messages.

/PRODMON
This directory contains the script and executable files for generating *AWN* Product Generation Monitor messages.

README
Information about the directory and files in it.

gen_log
Directory containing all *AWN* product generation process status information.

gen_mon.csh
Script launched by crontab on a per product basis (jet_stream, lightning, echo_tops, nowrad6, nowrad_lab, text, winds_aloft) that generates an *AWN* product status message.

pd_gen_mon
Executable launched by gen_mon.csh to read gen_log messages and create *AWN* product generation messages.

send_gen_msg.csh
Script that sends *AWN* product generation alert messages to operators.

work_dir
Directory containing late messages used to notify operators of product generation process status.

The following are AWN Product Generation Routines and Files:

/PRODGEN
Directory that houses all the *AWN* product generation processes.

README
Information about the directory and the files in it.

degriber
Directory that houses the *AWN* product generation degriber executable and script files.

echo_tops
Directory that houses the *AWN* product generation echo_tops executable and script files.

gen.cron
File that contains cron instructions for running all product generation and product ingest monitoring processes. This file is read by cron from the *AWN* account.

jet_stream
Directory that houses the *AWN* product generation jet stream executable and script files.

lightning
Directory that houses the *AWN* product generation lightning executable and script files.

nowrad6
Directory that houses the *AWN* product generation nowrad6 executable and script files.

nowrad_lab
Directory that houses the *AWN* product generation nowrad_lab executable and script files.

text
Directory that houses the *AWN* product generation text executable and script files.

winds_aloft
Directory that houses the *AWN* product generation winds aloft executable and script files.

PRODGEN/degriber
This directory contains the executables and script files required for degribing the RUC_211 grib data sets.

README
Information about the directory and the files in it.

aloft
Directory that holds the winds aloft data file that was copied from the FSL data stream before it is placed on the *AWN* file server.

degriber
Degriber executable.

degriber.csh
Script file for launching the degriber executable. This file can be run from the *AWN* operators account by typing degriber.csh. This script is normally launched by cron every three hours.

degriber.log
File containing ASCII text error messages generated by the degriber executable.

get_name
Executable for creating product generation product file names.

jet_stream
Directory that holds the jet_stream data file that was copied from the FSL data stream before it is placed on the *AWN* file server.

mon_log
Directory that holds product monitor notifications.

product
Degribed RUC_211 data.

raw_data
Holds RUC_211 data in grib format.

set_gen_stamp
Notifies product monitor of jet_stream and winds_aloft product availability.

/PRODGEN/echo_tops

This directory contains the executables and script files for creating the echo_tops DGM graphic product.

README
Information about this directory and the files in it.

echo_tops
Executable that generates the DGM echo tops graphic.

echo_tops.csh
Script file launched by crontab to initiate the echo_tops executable.

mon_log
Directory containing Product Generation Monitor notification messages.

product
Directory that holds the echo tops DGM graphic on completion.

raw_data
Directory that contains the encoded NEXET data.

raw_nowrad
Directory that contains the encoded NOWRADHF verification data.

PRODGEN/jet_stream

This directory contains the executables and script files required for generating the jet_stream DGM graphics products.

README
Information about this directory and the files in it.

get_name
Executable for creating product generation product file names.

grid211.sup
SUP file defining RUC_211 grids.

jet_cpy.csh
Script file for copying the RUC 60km jet_stream product from the FSL data stream to the *AWN* file server.

jet_stream
Jet_stream product generation executable.

jet_stream.csh
Script file for launching the jet_stream executable.

jet_stream.log
File containing ASCII text error messages generated by the jet_stream executable.

maps60.sup
SUP file defining RUC hybrid b grids.

mon_log
Product generation notification directory.

product
Jet_stream DGM graphics data file directory.

raw_data
Holds grib formatted RUC_211 data files before they are converted to jet_stream DGM graphics files.

set_gen_stamp
Executable for making product generation monitor notifications.

PRODGEN/lightning

This directory contains the executables and script files required for generating the lightning DGM graphics products.

README
Information about this directory and the files in it.

lightning
Lightning product generation executable.

lightning.csh
Script file for launching the lightning executable.

lightning.log
File containing ASCII text error messages generated by the lightning executable.

ing_data
Holds encrypted lightning data files created by the lightning_ingest routines.

mon_log
Directory that holds all product generation monitor messages.

product
Lightning DGM graphics data file directory.

raw_data
Holds ASCII lightning strike data files before they are converted to DGM graphics files.

PRODGEN/nowrad6
This directory contains the executables and script files required for generating the NOWRAD6 DGM graphics product.

README
Information about this directory and the files in it.

mon_log
Product generation monitor log messages directory.

nowrad6
Nowrad6 product generation executable.

nowrad6.csh
Script file for launching the nowrad6 executable.

nowrad6.log
File containing ASCII text error messages generated by the nowrad6 executable.

product
Nowrad6 DGM graphics data file directory.

raw_data
Encrypted NOWRADHF raw data directory.

/PRODGEN/nowrad_lab
This directory contains the executables and script files required for generating the NOWRAD_LAB DGM graphics product.

README
Information about this directory and the files in it.

mon_log
Product generation monitor log messages directory.

nowrad_lab.csh
Script launched by cron that copies the required nowrad_lab product from the FSL data stream to the *AWN* file server.

nowrad_lab
Holds ground radar location files before they are merged with storm data message files and converted to DGM graphics files.

nowrad_lab.log
File containing ASCII text error messages generated by the nowrad_lab executable.

product
Nowrad_lab DGM graphics data file directory.

raw_data
Storm raw data directory.

PRODGEN/text

This directory contains the executables and script files required for generating the METAR, SA, TAF, and NWS ten minute text products.

README
Information about this directory and the files in it.

mon_log
Product generation monitor log messages dir.

text.csh
Script file for launching the text executable.

text.log
ASCII log file containing error messages generated by the text.csh script.

text_mon
Executable that generates product generation notification messages.

PRODGEN/winds_aloft

This directory contains the scripts and executables required for creating the gridded winds product.

README
Information about this directory and the files in it.

grid211.sup
SUP file defining RUC_211 grids.

maps60.sup
SUP file defining RUC hybrid b grids.

mon_log
Product generation monitor log messages directory.

product
Winds aloft gridded binary data file directory.

raw_data
Holds grib formatted RUC_211 data files before they are converted to the gridded winds aloft data product.

winds_aloft
Executable for creating the winds_aloft product.

winds_aloft.csh
Script file that launches the winds_aloft executable.

winds_aloft.log
ASCII file containing all the error messages generated by the winds_aloft.csh script file and the winds_aloft executable.

winds_header.dat
Header portion of the gridded winds product.

/PRODMON

This directory contains the script and executable files for generating *AWN* Product Ingest Monitor messages.

README
Information about the directory and files in it.

ing_log
Directory containing all product ingest process status log information.

ing_mon.csh
Script launched by crontab on a per ingest stream basis (hrs, lightning, nowrad, text) that generates a product ingest status message.

pd_ing_mon
Executable launched by ing_mon.csh to read ing_log messages and create *AWN* product ingest messages.

send_ing_msg.csh
Script that sends *AWN* product ingest alert messages to operators.

work_dir
Directory containing late messages used to notify operators of *AWN* product ingest.